CLAIMS

1. A method for treating a condition of a subject, comprising:

driving into longitudinal nervous tissue of the subject a current which is capable of inducing action potentials that propagate in the nervous tissue in a first direction, so as to treat the condition; and

suppressing action potentials from propagating in the nervous tissue in a second direction opposite to the first direction.

2. A method according to claim 1, wherein driving the current comprises driving a current capable of inducing action potentials that propagate in the nervous tissue in an afferent direction with respect to the central nervous system of the subject.

3. A method according to claim 1, wherein driving the current comprises driving a current capable of inducing action potentials that propagate in the nervous tissue in an efferent direction with respect to the central nervous system of the subject.

4. A method according to claim 1, wherein driving the current comprises driving the current into a vagus nerve of the subject.

5. A method according to claim 1, wherein the method comprises driving the current and suppressing the action potentials at substantially the same time.

6. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating an involuntary movement disorder of the subject.

7. A method according to claim 1, wherein suppressing the action potentials comprises regulating the

suppressing of the action potentials so as to inhibit an undesired response of the central nervous system of the subject generated responsive to driving the current into the nervous tissue.

8. A method according to claim 1, wherein suppressing the action potentials comprises regulating the suppressing of the action potentials so as to inhibit an undesired sensation generated responsive to driving the current into the nervous tissue.

9. A method according to claim 1, wherein suppressing the action potentials comprises suppressing action potentials induced responsive to driving the current.

10. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating a sleep disorder of the subject.

11. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating a gastrointestinal motility disorder of the subject.

12. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating an eating disorder of the subject.

13. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating obesity of the subject.

14. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating anorexia of the subject.

15. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating a gastrointestinal tract disorder of the subject.

16. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating hypertension of the subject.

17. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating coma of the subject.

18. A method according to claim 1, wherein driving the current comprises configuring the current to be capable of treating epilepsy of the subject.

19. A method according to claim 1, wherein driving the current comprises driving the current into a vagus nerve of the subject and configuring the current to be capable of treating epilepsy of the subject, and wherein suppressing the action potentials comprises suppressing action potentials that interfere with an ability of the subject to speak.

20. A method according to claim 1, wherein driving the current comprises applying to a vagus nerve of the subject a current capable of inducing constriction of a lower esophageal sphincter of the subject.

21. A method according to claim 1, wherein suppressing the action potentials comprises suppressing the action potentials repeatedly, during a series of temporally non-contiguous action potential suppression periods, and wherein the method comprises substantially withholding the suppressing of action potentials between the action potential suppression periods.

22. A method according to claim 1, wherein driving the current comprises driving the current into nervous tissue of the central nervous system of the subject.

23. A method according to claim 1, wherein driving the current comprises driving the current into nervous tissue of the peripheral nervous system of the subject.

24. A method according to claim 1, wherein suppressing the action potentials comprises identifying an action potential conduction velocity and suppressing action potentials characterized by the identified conduction velocity.

25. A method according to claim 24, wherein the method comprises withholding suppression of an action potential having a conduction velocity substantially different from the identified conduction velocity.

26. A method according to claim 1, wherein suppressing the action potentials comprises regulating the suppressing of the action potentials so as to inhibit an undesired effector action responsive to driving the current into the nervous tissue.

27. A method according to claim 26, wherein suppressing the action potentials comprises suppressing generation of action potentials that induce increased acid secretion in a gastrointestinal tract of the subject.

28. A method according to claim 26, wherein suppressing the action potentials comprises suppressing generation of action potentials that induce muscular contraction.

29. A method according to claim 26, wherein suppressing the action potentials comprises suppressing generation of action potentials that induce bradycardia.

30. A method according to claim 1, wherein suppressing the action potentials comprises applying an electric field to the nervous tissue.

31. A method according to claim 30, wherein applying the field comprises applying a plurality of electric fields

to the nervous tissue at respective longitudinal sites thereof.

32. A method according to claim 31, wherein applying the plurality of electric fields to the nervous tissue comprises applying each of the fields at a different respective time.

33. A method according to claim 31, wherein applying the fields at the respective longitudinal sites comprises applying the fields at two adjacent sites separated by at least about 2 mm.

34. A method according to claim 31, wherein applying the fields at the respective longitudinal sites comprises applying the fields at two adjacent sites separated by less than about 4 mm.

35. Apparatus for treating a condition of a subject, comprising:

an electrode device, adapted to be coupled to longitudinal nervous tissue of the subject; and

a control unit, adapted to drive the electrode device to apply to the nervous tissue a current which is capable of inducing action potentials that propagate in the nervous tissue in a first direction, so as to treat the condition, and adapted to suppress action potentials from propagating in the nervous tissue in a second direction opposite to the first direction.

36. Apparatus according to claim 35, wherein the control unit is adapted to drive the electrode device to apply a current capable of inducing action potentials that propagate in the nervous tissue in an afferent direction with respect to the central nervous system of the subject, so as to treat the condition.

37. Apparatus according to claim 35, wherein the control unit is adapted to drive the electrode device to apply a current capable of inducing action potentials that propagate in the nervous tissue in an efferent direction with respect to the central nervous system of the subject, so as to treat the condition.

38. Apparatus according to claim 35, wherein the electrode device is adapted to be coupled to a vagus nerve of the subject.

39. Apparatus according to claim 35, wherein the control unit is adapted to: (a) drive the electrode device to apply the current, and (b) suppress the action potentials, at substantially the same time.

40. Apparatus according to claim 35, wherein the control unit is adapted to configure the current to be capable of treating an involuntary movement disorder of the subject.

41. Apparatus according to claim 35, wherein the control unit is adapted to regulate the suppressing of the action potentials so as to inhibit an undesired response of the central nervous system of the subject generated responsive to the electrode device applying the current to the nervous tissue.

42. Apparatus according to claim 35, wherein the control unit is adapted to regulate the suppressing of the action potentials so as to inhibit an undesired sensation generated responsive to the electrode device applying the current to the nervous tissue.

43. Apparatus according to claim 35, wherein the control unit is adapted to regulate the suppressing of the action potentials so as to suppress action potentials induced responsive to the electrode device applying the current.

44. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating a sleep disorder of the subject.

45. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating a gastrointestinal motility disorder of the subject.

46. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating an eating disorder of the subject.

47. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating obesity of the subject.

48. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating anorexia of the subject.

49. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating a gastrointestinal tract disorder of the subject.

50. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating hypertension of the subject.

51. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating coma of the subject.

52. Apparatus according to claim 35, wherein the control unit is adapted to configure the current so as to be capable of treating epilepsy of the subject.

53. Apparatus according to claim 35, wherein the electrode device is adapted to be coupled to a vagus

nerve of the subject, and wherein the control unit is adapted to: (a) configure the current so as to be capable of treating epilepsy of the subject, and (b) suppress action potentials that interfere with an ability of the subject to speak.

54. Apparatus according to claim 35, wherein the electrode device is adapted to be coupled to a vagus nerve of the subject, and wherein the control unit is adapted to configure the current so as to be capable of inducing constriction of a lower esophageal sphincter of the subject.

55. Apparatus according to claim 35, wherein the control unit is adapted to suppress the action potentials repeatedly, during a series of temporally non-contiguous action potential suppression periods, and wherein the control unit is adapted to substantially withhold the suppressing of action potentials during respective times between the action potential suppression periods.

56. Apparatus according to claim 35, wherein the electrode device is adapted to be coupled to longitudinal nervous tissue of the central nervous system of the subject.

57. Apparatus according to claim 35, wherein the electrode device is adapted to be coupled to nervous tissue of the peripheral nervous system of the subject.

58. Apparatus according to claim 35, wherein the control unit is adapted to identify an action potential conduction velocity, and to suppress action potentials characterized by the identified conduction velocity.

59. Apparatus according to claim 58, wherein the control unit is adapted to withhold suppression of an action

potential having a conduction velocity substantially different from the identified conduction velocity.

60. Apparatus according to claim 35, wherein the control unit is adapted to regulate the suppressing of the action potentials so as to inhibit an undesired effector action responsive to driving the electrode device to apply the current to the nervous tissue.

61. Apparatus according to claim 60, wherein the control unit is adapted to suppress generation of action potentials that induce increased acid secretion in a gastrointestinal tract of the subject.

62. Apparatus according to claim 60, wherein the control unit is adapted to suppress generation of action potentials that induce muscular contraction.

63. Apparatus according to claim 60, wherein the control unit is adapted to suppress generation of action potentials that induce bradycardia.

64. Apparatus according to claim 35, wherein the control unit is adapted to drive the electrode device to apply an electric field to the nervous tissue configured to suppress the action potentials.

65. Apparatus according to claim 64, wherein the electrode device comprises a plurality of electrode devices, adapted to be coupled to the nervous tissue at respective longitudinal sites thereof.

66. Apparatus according to claim 65, wherein the control unit is adapted to drive the plurality of electrode devices to apply a respective plurality of electric fields to the nervous tissue, at different respective times.

67. Apparatus according to claim 65, wherein two of the plurality of electrode devices are adapted to be coupled

at adjacent ones of the sites that are separated by at least about 2 mm.

68. Apparatus according to claim 65, wherein two of the plurality of electrode devices are adapted to be coupled at adjacent ones of the sites that are separated by less than about 4 mm.

69. Apparatus according to claim 35, and comprising a sensor adapted to sense an indication of a presence of the condition and to generate a sensor signal responsive thereto, wherein the control unit is adapted to drive the electrode device responsive to the sensor signal.

70. Apparatus according to claim 35, wherein the control unit is adapted to receive an input from the subject and to drive the electrode device responsive to the input.

71. A method according to claim 1, and comprising sensing an indication of a presence of the condition, wherein driving the current comprises driving the current responsive to sensing the indication.

72. A method according to claim 1, and comprising receiving an input from the subject, wherein driving the current comprises driving the current responsive to receiving the input.